

3.5.1 Anthropometry

I. PURPOSE

II. MATERIALS AND EQUIPMENT

- Stadiometer (Accu-Hite Measure Device with level bubble)
- Detecto Platform Balance Scale in lbs/kg
- Gulick II 150 cm anthropometric tape
- Full length mirror
- Four 50-pound weights (certified prior to first MESA visit) to calibrate scale

III. DEFINITIONS

IV. METHODS

1. General Instructions for Body Size Measurements

- 1.1 For all measurements, participants should wear light clothing but no shoes (thin socks or “pillow slippers” OK). Keep a supply of surgical scrubs at the clinical center for participants who forget to wear or bring the appropriate clothes. Have participants completely empty their pockets and remove excessive amounts of jewelry that could affect the weight measurement. Provide lockers with locks for valuables.
- 1.2 Pregnant women should not be measured, regardless of gestational stage (check exclusion criteria for pregnancy). The Clinic Coordinator should ascertain pregnancy status, both for measurements and for subsequent coronary calcification measurement.
- 1.3 Take a single measurement at each body site and record using specific rounding rules. Record any modifications in measurement techniques (e.g., height decreased from a hunched posture or weight that exceeds the capacity of the scale) on the Anthropometry Form.

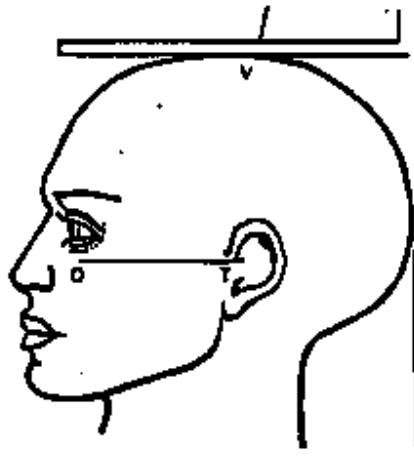
2. Standing Body Height

2.1 Equipment

- Stadiometer (Accu-Hite Measure Device with level bubble)

- 2.2 Before measuring height, check to make sure the floor is level, the wall is at a 90 degree angle to the floor, the wall is straight, and the Stadiometer is mounted perpendicular to the floor.

- 2.3 For accurate measurement of height, the participant must be standing in a vertical plane. To achieve this position, have the participant stand erect on the floor or horizontal platform, with back against the vertical Stadiometer, heels against the wall, and feet *or* knees together—whichever come together first. Have the participant look straight ahead, with head in the Frankfort horizontal plane (Figure 1, below).



The Frankfort Plane includes the lower margin of the bony orbit (the bony socket containing the eye) and the most forward point in the supratragal notch (the notch just above the anterior cartilaginous projections of the external ear)—also referred to as the upper margin of the external auditory meatus (the hole in the ear).

Figure 1. Frankfort Plane for Measuring Body Height

- 2.4 Place the headboard over the crown of the head, with the headboard forming a right angle to the scale. The headboard should touch the scalp lightly.
- 2.5 Ask the participant to step out from under the headboard. *Record the participant's height to the nearest 0.1 centimeter in Box 1a of the Anthropometry Form.*
- 2.6 If you are unable to measure the actual height of the participant because the headboard does not rest directly over the scalp, *estimate height to the nearest 0.1 cm, record in Box 1a of the Anthropometry Form and answer "yes" to the question, "Was there a modification in protocol?"*
3. Body Weight
- 3.1 Equipment
- Detecto Platform Balance Scale in lbs/kg

- 3.2 Balance the scale so that the indicator is at zero when no weight is on the scale. The scale should be on a firm, level surface (not on a carpet, for example). Instruct the participant to stand in the middle of the platform of the balance scale, with head erect and eyes looking straight ahead. Adjust the weight on the indicator until it is balanced. *Record the results, to the nearest pound, in Box 2a on the Anthropometry Form.*
- 3.3 If the participant is too obese to stand securely on the scale's platform when looking straight ahead, he/she may stand sideways on the scale to take the weight measurement; facing to the side rather than the front will provide the participant a wider base and more stability.
- 3.4 If a participant has a prosthetic limb or breast prosthesis, measure weight with the limb *on*.
- 3.5 If a participant is frail or unsteady, measure weight while participant is lightly steadied by you or an assistant.
- 3.6 If a participant is unable to stand on the scale for a weight measurement, do not attempt a weight measurement. *Answer "yes" to the question, "Was there a modification in protocol?"*

4. Girth Measurements

4.1 Equipment

- Gulick II 150 cm anthropometric tape
- Full length mirror

4.2 Technique

- 4.21 Do *not* take abdominal and hip girth measurements over clothing.
- 4.22 If a participant is very large, you may have him/her hold one end of the tape while walking the tape around to obtain the measurement. If any circumference exceeds 150 cm, use the 250 cm tape measure. (Take care not to offend the person being measured, and change to the larger tape as discretely as possible.)

4.3 Abdominal Girth

Apply a Gulick II anthropometric tape horizontally at the level of the umbilicus and instruct the participant to breathe normally. Move to the

participant's right side to take the measurement; do not take this measurement from the front. Be sure to keep the tape horizontal while making the measurement; use the wall-mounted mirror to assure horizontal placement on all sides. *Round abdominal girth measurement to the nearest cm and record in Box 3a on the Anthropometry Form. If the circumference exceeds 150 cm, record "yes" for the question, "Was there a modification in protocol?"*

4.5 Hip Girth

Take the hip girth measurement from the participant's right side; do not take this measurement from the front. Instruct the participant to stand with his/her feet together. Measure hip girth at the maximum circumference of the buttocks.. Check to see that the tape is level in front and back. *Round hip girth measurement to the nearest cm and record in Box 3b on the Anthropometry Form. If the circumference exceeds 150 cm, record "yes" for the question, "Was there a modification in protocol?"*

5. Comments/Modifications to the Protocol

If you have comments or if there have been modifications to the protocol, as described above, answer "yes" to question 4 on the Anthropometry Form and record comments in the space provided. If there are no comments or modifications, answer "no" to question 4.

6. Calibration Check of Scales and Equipment Check

6.1 Equipment:

- Four 50-pound weights (certified prior to first MESA visit) to calibrate scale
- Gulick II anthropometric tapes

6.2 Check scales for accuracy on a monthly basis.

- 6.21 Place two weights on the scale and record the numeric value obtained in the "Light Poise" column of the "Scale Calibration Checklist." Add two more weights and record the numeric value obtained in the "Heavy Poise" column.
- 6.22 The values obtained should be within ± 1.0 pound of the expected weight. If either value exceeds this limit, the scale must be calibrated by the manufacturer or by the appropriate institution personnel.

- 6.23 When the scale is not in use, keep it balanced at 300 pounds.
This keeps the tension off the internal spring mechanism.
- 6.3 Examine anthropometry tape measures on a weekly basis for sign of wear.